CLAIMS

1. A process for preparing (per)fluorohalogenethers containing the $-SO_2F$ group and having general formula (I):

$$FSO_2-R-CF_2OCAF-CA'F_2 \qquad (I)$$

wherein:

- A and A', equal to or different from each other, are Cl or Br;
- R can have the following meanings: a (per)fluorinated, preferably perfluorinated, substituent, selected from the following groups: linear or branched C_1-C_{20} alkyl, C_3-C_7 cycloalkyl; aromatic, C_6-C_{10} arylalkyl or alkylaryl; C_5-C_{10} heterocyclic or alkylhetero-cyclic;

  optionally containing one or more oxygen atoms;

  when R is fluorinated, it can optionally contain one or more H atoms and/or one or more halogen atoms different from F;

by reaction of carbonyl compounds having formula (II):

$$FSO_2-R-COF \qquad (II)$$

wherein R is as above;

in liquid phase with elemental fluorine and with olefinic compounds having formula (III):

$$CAF=CA'F \qquad (III)$$

wherein A and A'are as above,

by operating at temperatures from -120°C to -20°C, preferably from -100°C to -40°C, optionally in the presence of a solvent inert under the reaction conditions.

2. A process according to claim 1, wherein the fluorine is diluted with an inert gas selected between nitrogen or helium.

3. A process according to claims 1-2, wherein the formula (III) compounds are selected from 1,2-dichloro-1,2-difluoroethylene (CFC 1112), 1,2-dibromo-1,2-difluoroethylene, preferably CFC 1112.

4. A process according to claims 1-3, wherein the solvent is selected from the group comprising the following compounds: (per)fluorocarbons, (per)fluoroethers, (per)fluoropolyethers, perfluoroamines, or respective mixtures; fluoropolyethers containing at least one hydrogen atom in one end group, preferably in both end groups; fluoroethers containing at least one hydrogen atom in one end group, preferably in both end groups, or containing non fluorinated end groups of the type OR_a wherein R_a is an alkyl from 1 to 3 carbon atoms.

5. A process according to claims 1-4, wherein, when R in formula (I) is fluorinated, it optionally contains one or more H atoms and/or one or more halogen atoms different

from F, preferably Cl.

6. A process according to claims 1-5 carried out in a semi-continuous or a continuous way.

7. A semicontinuous process according to claim 6, wherein the molar ratio (II):(III) ranges from 10:1 to 1:20 and the used amount by moles of fluorine is equal to or lower than the amount by moles of (III).

8. A continuous process according to claim 6, wherein the molar ratio (II):(III) is as defined in claim 7 and the molar ratio F_2:(III) ranges from 1:20 to 10:1.

9. A process according to claims 1-8, wherein one operates at partial conversion of compound (II), preferably the conversion ranges from 10% to 40%, still more preferably from 10% to 20%.

10. A process according to claims 1-9, wherein the dehalogenation step is carried out to obtain the fluorinated vinylethers.